

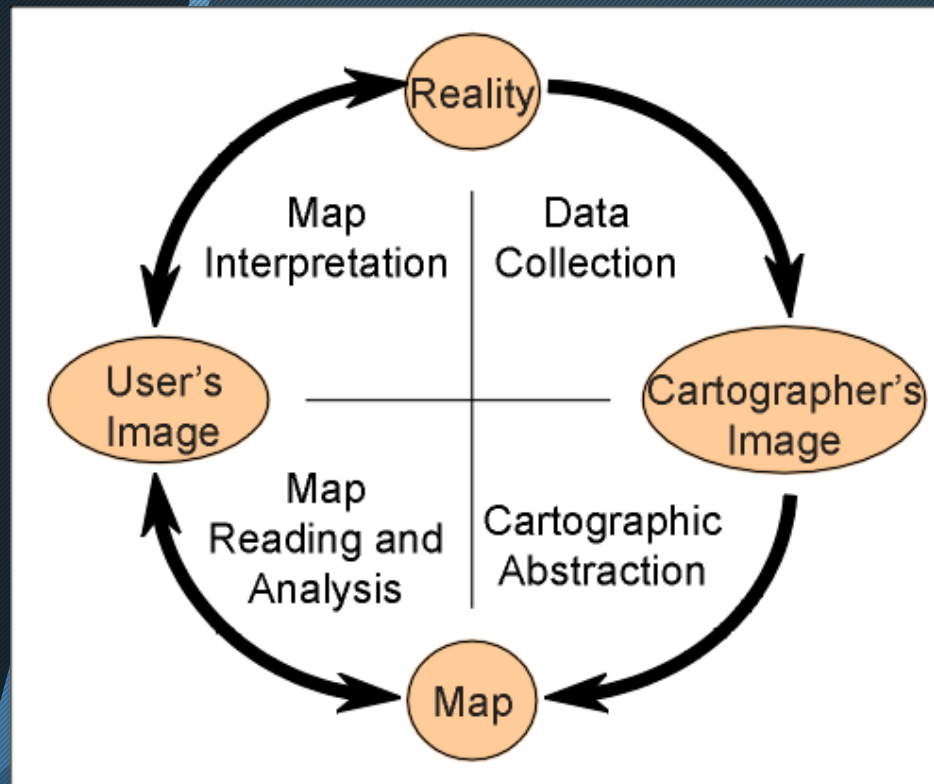
Map Design

“The ‘art’ of cartography...is not simply an anachronism surviving from some prescientific era; it is an integral part of the cartographic process.”

- John Keates

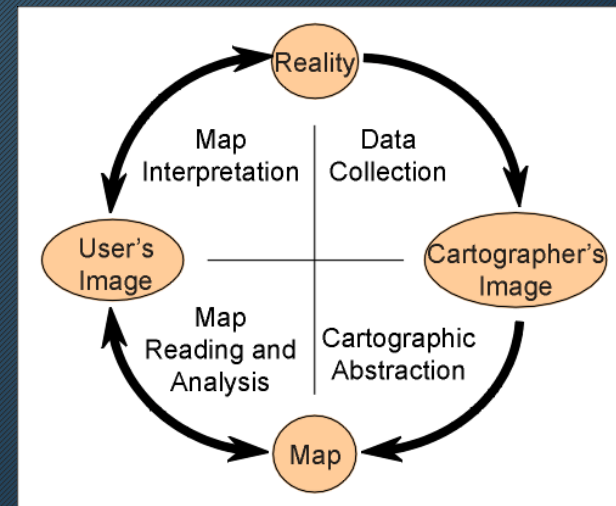
Map Design

“ Poorly designed maps are not just hard on the eyes, they can actually convey misinformation and result in poor decision making.



Map Design Process

- “ Determine the objectives of the map.
- “ Decide on the data layers to be included.
- “ Plan a layout.
- “ Choose colors and symbols.
- “ Create the map.



Questions to consider

- “ Who will be using the map?
- “ Under what circumstances will the map be used?
“
- “ Is the map likely to be copied or faxed?
- “ What objectives should the map achieve?
- “ How sensitive is the map information?

Map Pieces

“ Putting together the big picture: arranging and rearranging the map and its associated pieces:

“ Title

“ Scale

“ Explanatory text

“ Legend

“ Directional indicator

“ Border

“ Sources & Credits

“ Inset Maps

“ Locator Maps

Map Pieces

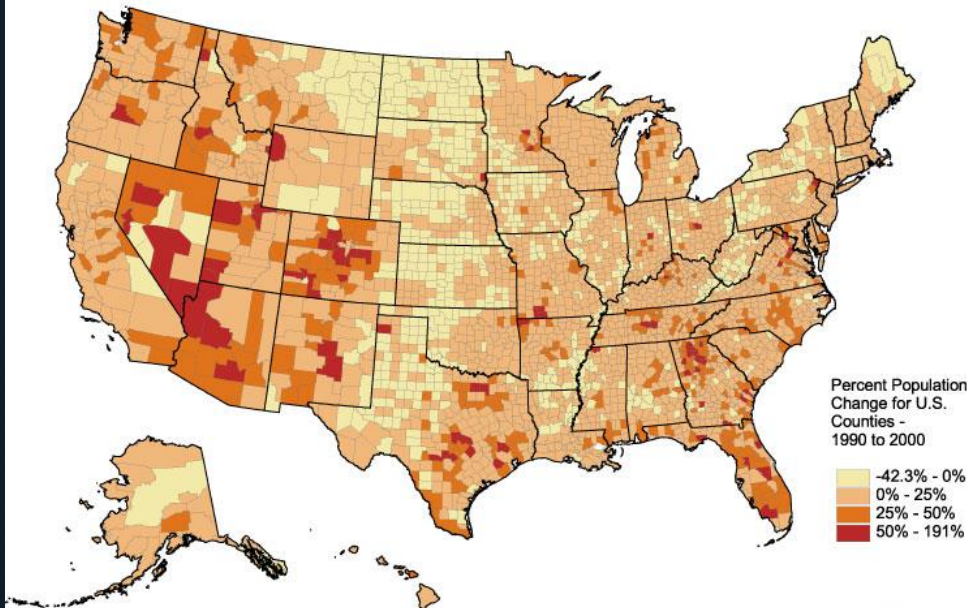
Title:

What: map topic

Where: geographic area

When: temporal info

Population Change 1990-2000



Source: United States Census Bureau, Census of Population and Housing, 2000
Note: Alaska and Hawaii are not to scale.



UNIVERSITY OF MINNESOTA

**Twin Cities Campus,
Minneapolis**

The University of Minnesota Twin Cities campus in Minneapolis is big, and so is this file.
On your screen, it will be about 18" wide and 22" tall. Enjoy your scroll!

- Art galleries, theaters, and museums
- Sparks and recreation
- Student services
- Public parking all day
- Public parking other 4:00 pm only
- Motor parking
- Code blue emergency telephone
- Emergency bus stop, with emergency consultation



KEEP IT CONCISE!!

Ex. Ethnic Groups in Columbus OH 1900 – 1960

Map Pieces

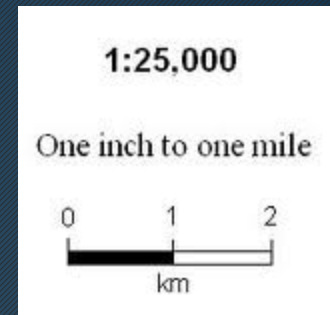
“Scale:

“ Verbal and visual scales are more intuitive

“ Numerical scales are more flexible

“ Small scale maps (entire earth or a large portion of it) should not include a simple visual scale, because such maps always contain substantial scale variations.

If your map's users might reduce or increase the size of the map a visual scale is best.



“Explanatory Text:



Map Pieces






Legend: the key to understanding symbols on the map





- include any map symbols that are not self-evident

You don't have to put 'key' or 'legend' @ the top!!!

Legend	
Hull Shapes = Types	Colors = Construction
	 Dugout
	 Skin-on-Frame
	 Sticks/Logs/Reeds
	 Hard-chined Plank-on-Frame
	 Round-bilged Plank-on-Frame
	
	
	

Legend	
 Asphalt Trail	 Recreational/Cultural Facility
 Gravel Trail	 School
 Connecting Sidewalk	 Other Facility
 Natural Path	 Arbor Grove
 Playlot	 Play Field
 Baseball Diamond	 Tennis Court
 Basketball Court	 Permanent Rink

Hispanic Population Density Persons per square kilometer	
	0 - 1 (21)
	1 - 2 (8)
	2 - 3 (7)
	3 - 5 (5)
	5 - 414 (12)

	38% to 57%
	57% to 74%
	74% to 90%
	90% to 95%

Map Pieces

When to use a North Arrow:

Unusual orientations

(ex. East is up)

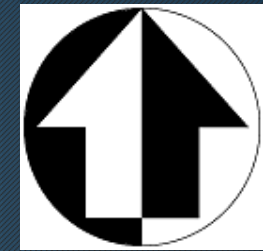
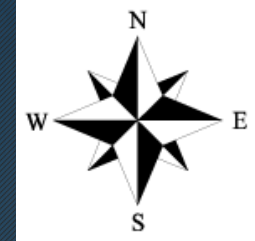
When direction is not obvious

(for more detailed, large scale maps)

When direction is important

(ex. Map of prevailing winds)

When the map is of an area unfamiliar to your intended audience

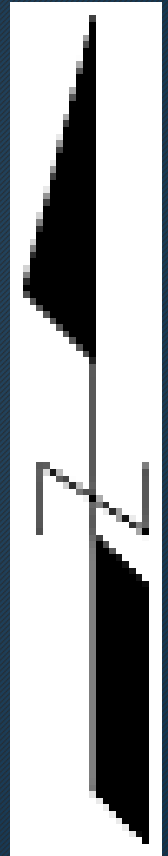
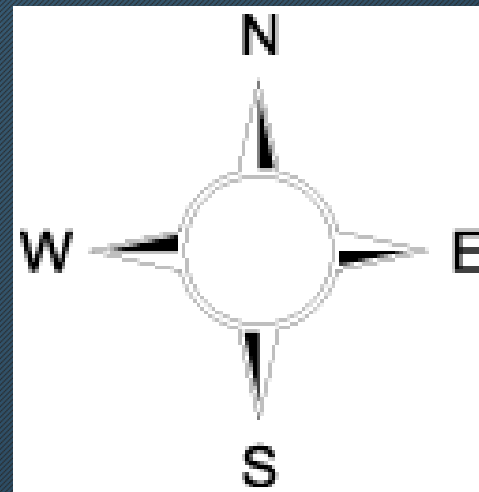


Map Pieces

When to use a North Arrow:

**DO NOT USE A HUMONGOUS NORTH ARROW
RELATIVE TO YOUR MAP.**

IT JUST LOOKS BAD...



<http://gislounge.com/to-north-arrow-or-not-to-north-arrow/>

<http://blogs.esri.com/Support/blogs/mappingcenter/archive/2007/06/08/does-every-map-need-a-north-arrow-and-scale-bar.aspx>

Map Pieces

Sources, Credits, etc.:

Might include:

Data sources & citations

Map maker and date (that's you!)

Organization & logos

Disclaimers and legal information

Map series information

Copyright and use issues

Map projection & coordinate system

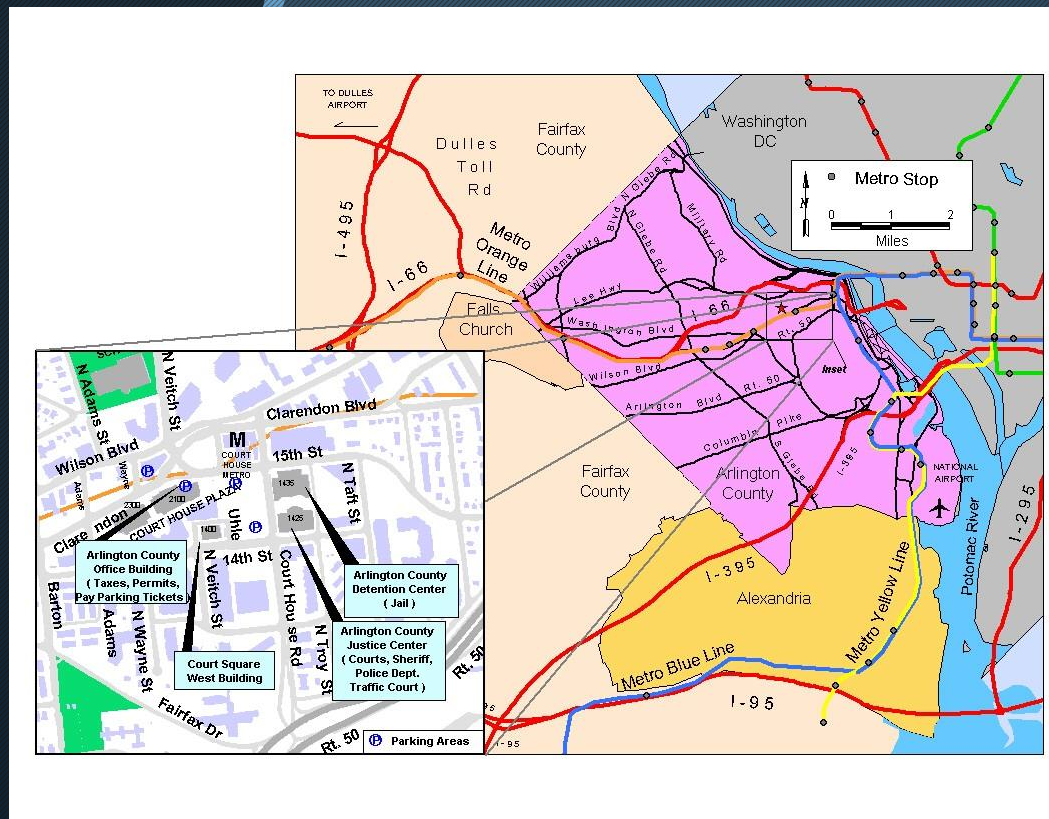
Produced by the SURVEYS AND MAPPING BRANCH,
DEPARTMENT OF ENERGY, MINES AND RESOURCES,
from aerial photographs taken in 1980. Culture check 1982. Published
in 1985.

Copies may be obtained from the Canada Map Office,
Department of Energy, Mines and Resources, Ottawa,
or your nearest map dealer.

Map Pieces

Inset & Locator Maps:

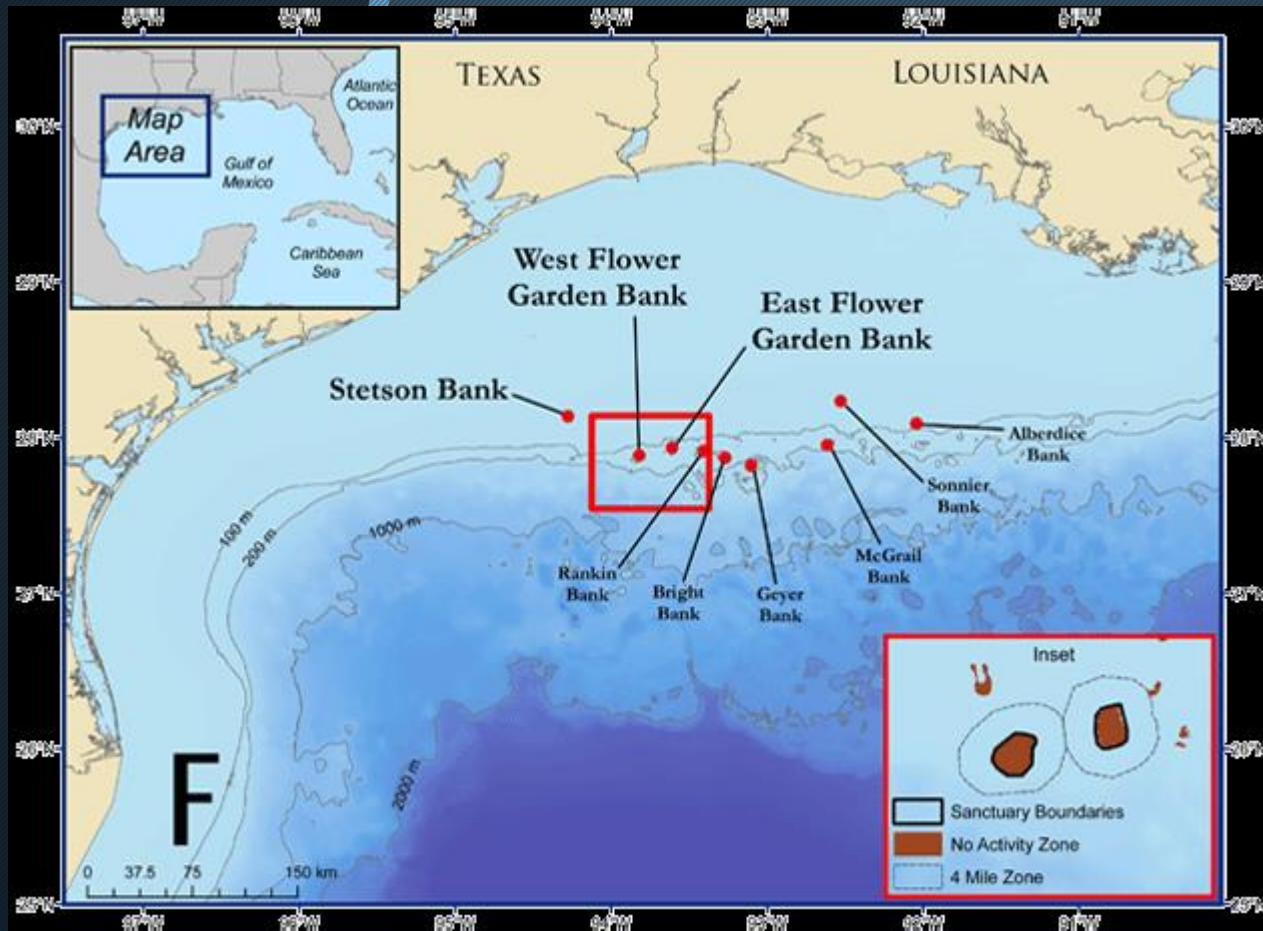
Can provide a larger scale view to understand areas that are difficult to see at the scale of the main map



Map Pieces

Inset & Locator Maps:

Can provide a smaller scale view that provides the context of the area on the main map.



What's our purpose again?

“ Map purpose drives:

“ The selection of base map data (scale, detail, projection)

“ The selection of thematic data

“ It also drives the DESIGN of the map:

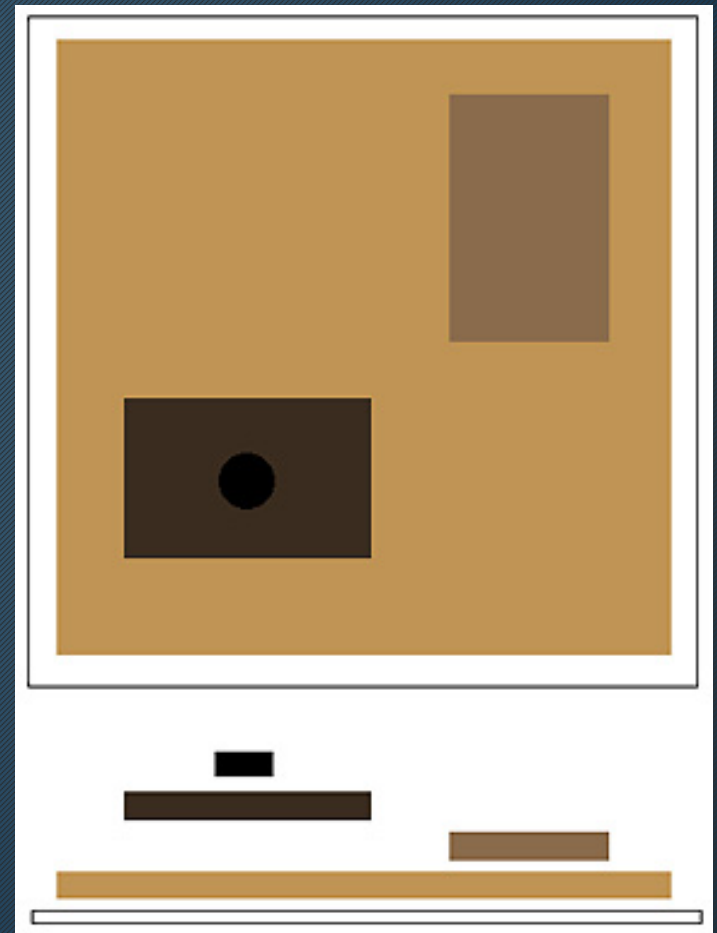
“ Suggests an **intellectual hierarchy** for the map

“ Which determines the map's **visual hierarchy**

Visual Hierarchy

“ Choose a visual hierarchy that represents the intellectual hierarchy

“ Visual hierarchy adds ‘depth’ to a flat paper or on-screen map



Visual Hierarchy

Failed visual hierarchy limits the map's ability to effectively communicate.

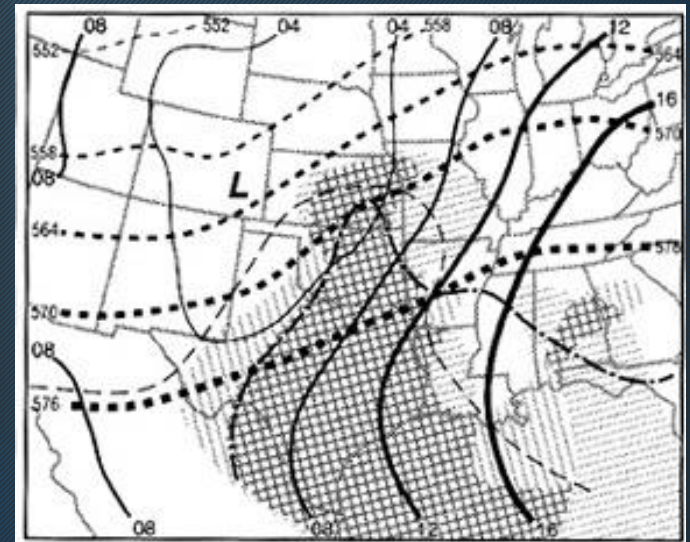
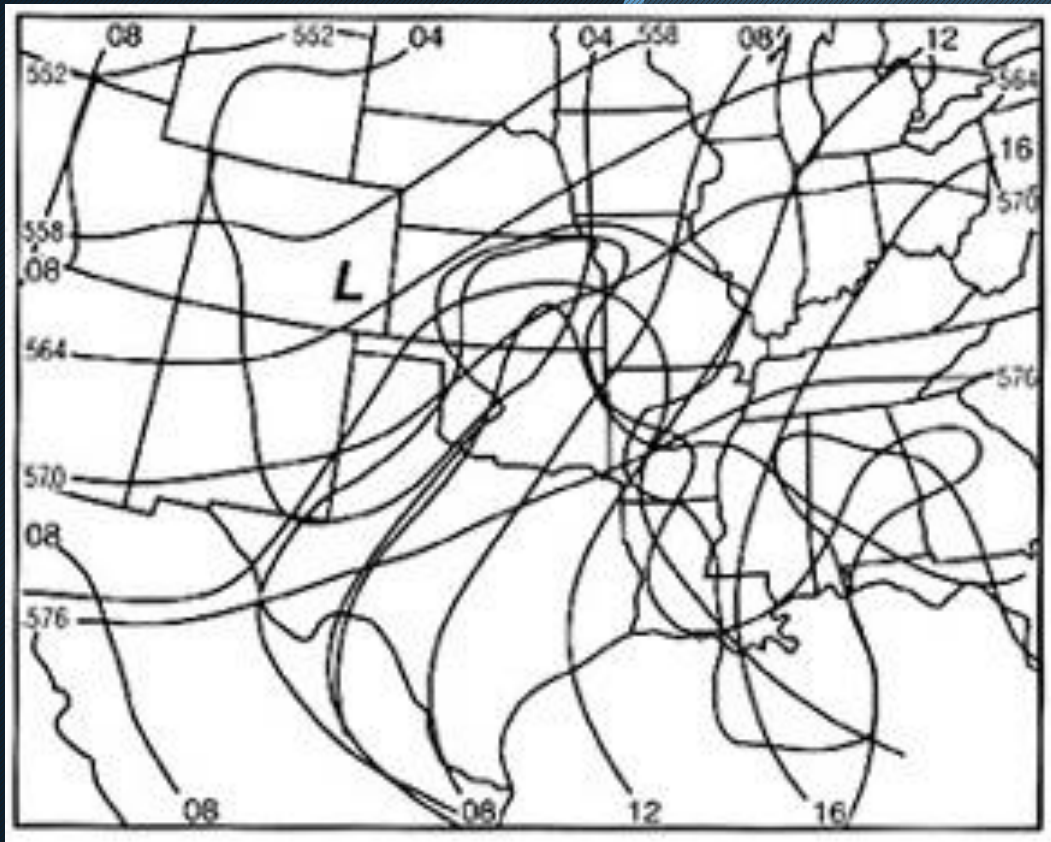


Figure - Ground

“ Figure - ground phenomena

“ We see objects having form as segregated from their surroundings which are formless

“ Objects that stand out against their backgrounds are called **figures** in perception, and their formless backgrounds are **grounds**



Figure - Ground

“ Gestalt Principles
“ Reversible figure-ground diagrams

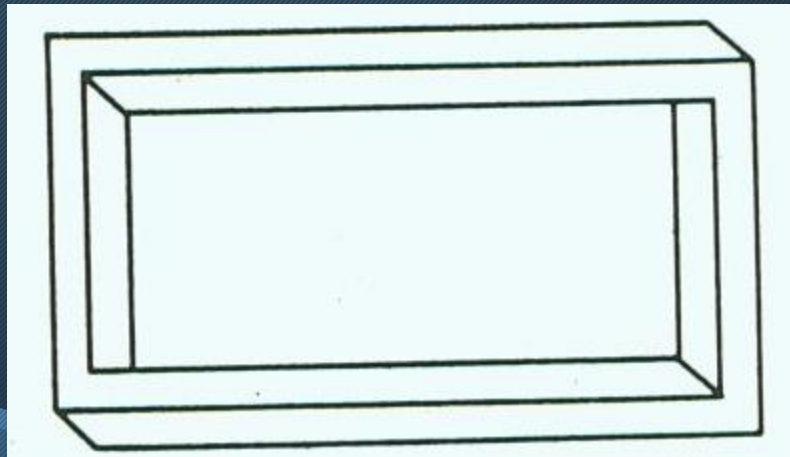
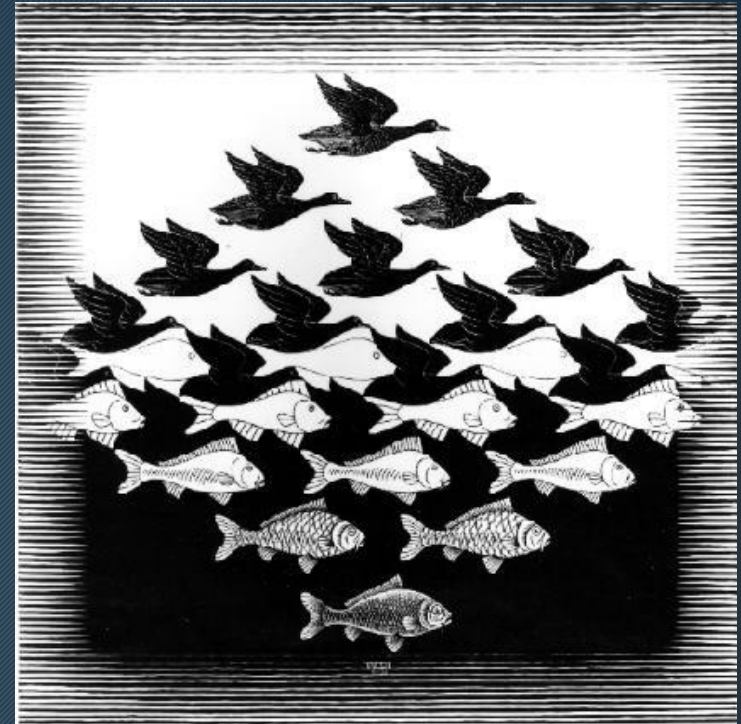
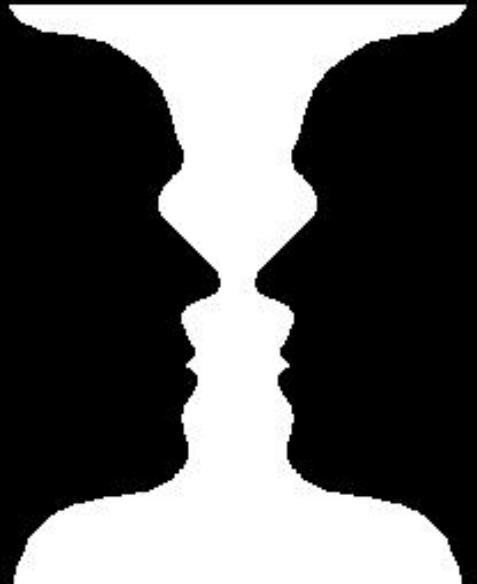
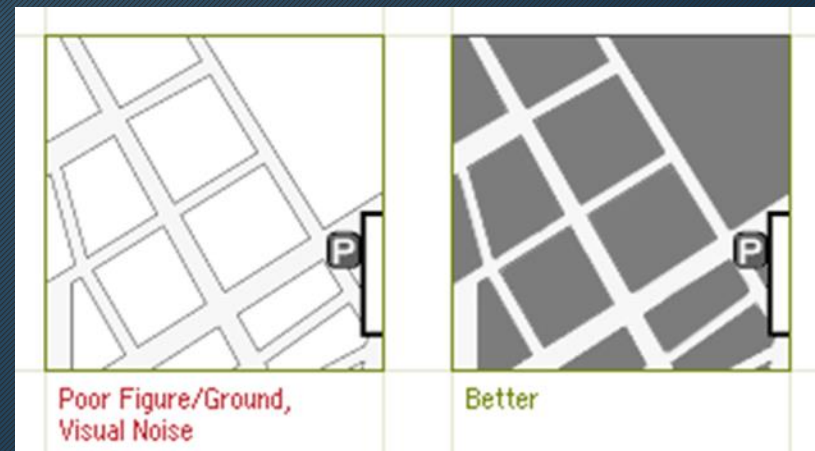
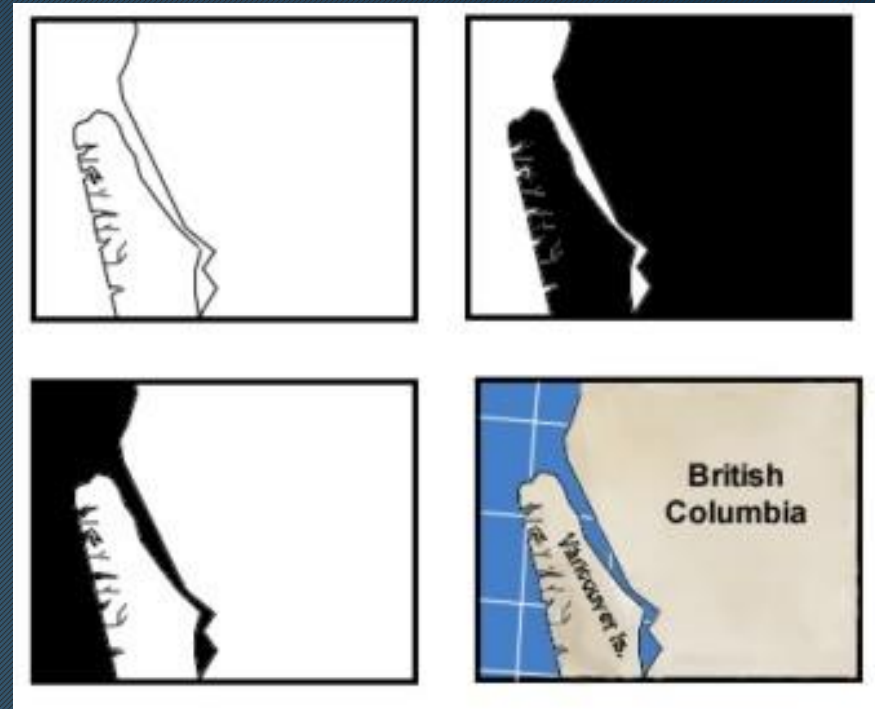
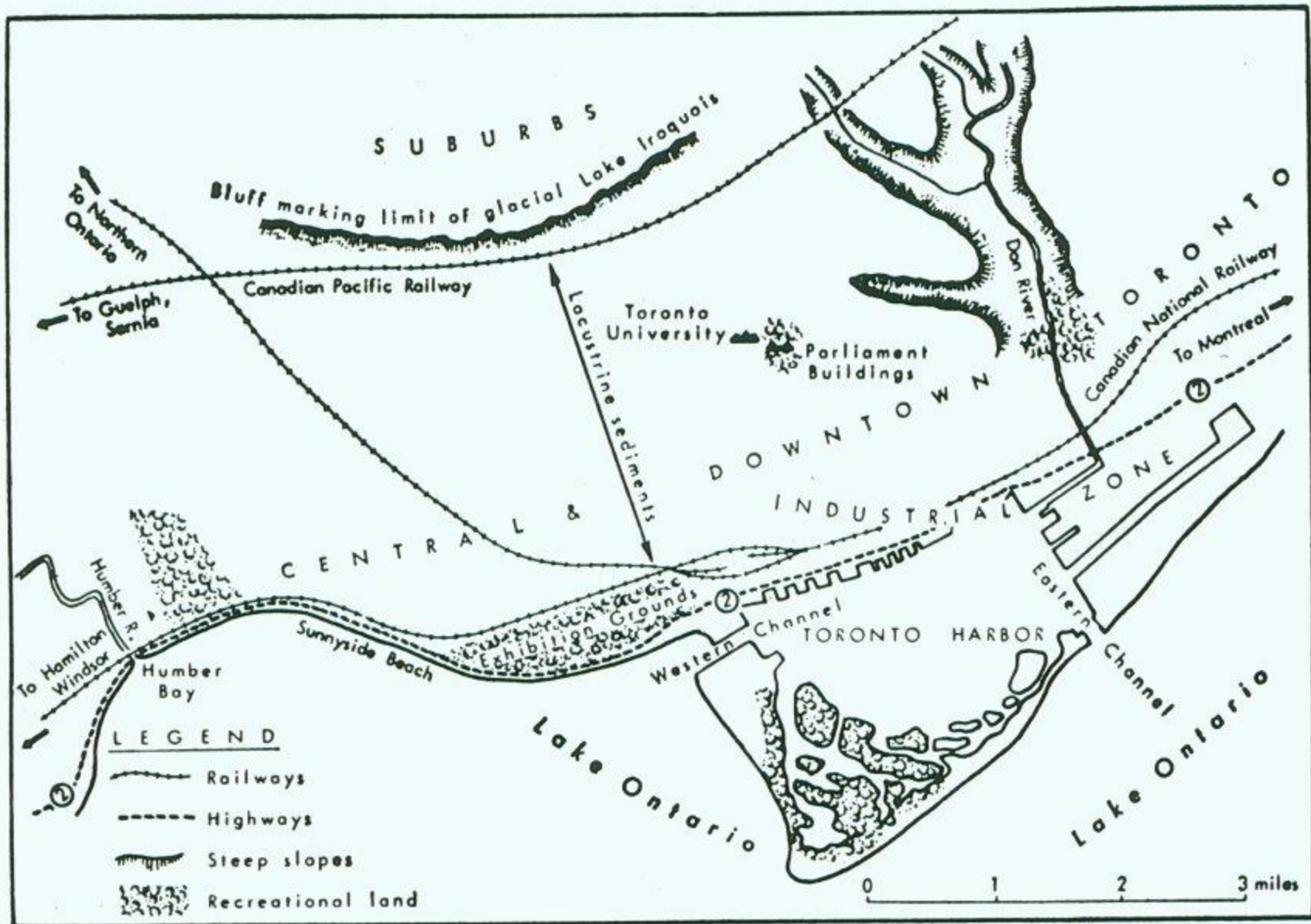


Figure - Ground

- “ Figure on Maps:
 - “ Most important map elements
 - “ More important meaning
 - “ Distinct form and shape
 - “ Jumps Out

- “ Ground on Maps
 - “ Least important map elements
 - “ Less important meaning
 - “ Indistinct form and shape
 - “ Falls back





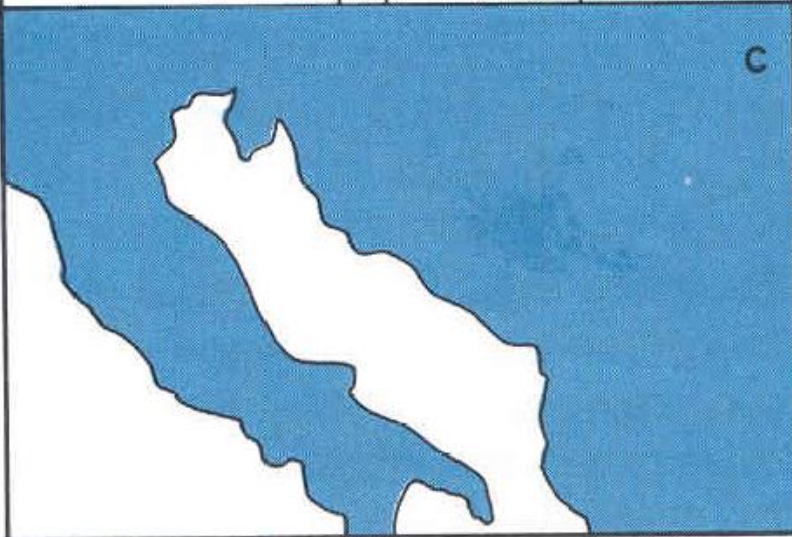
A



B

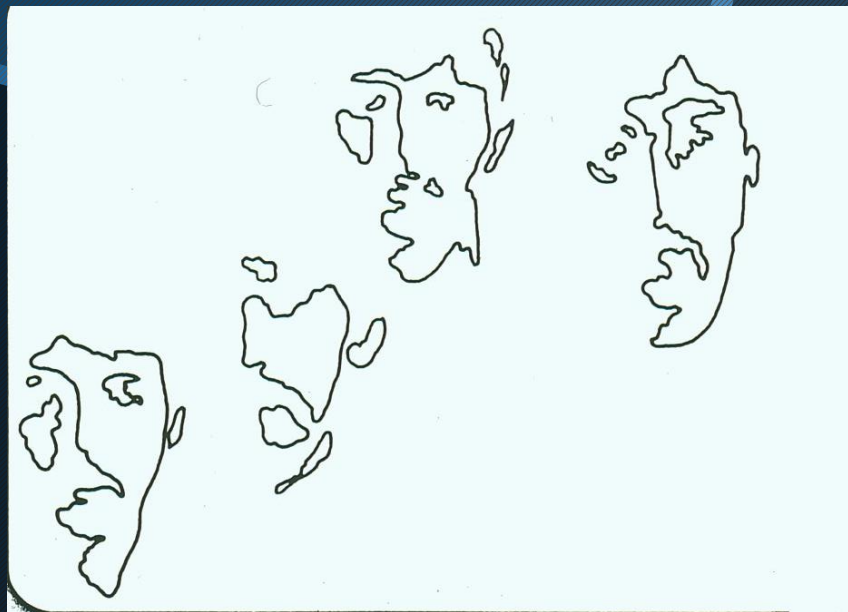


C



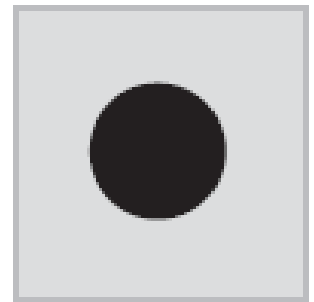
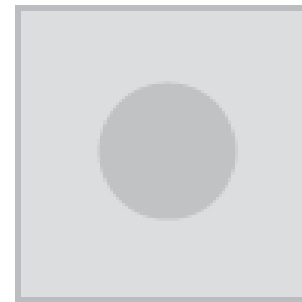
D



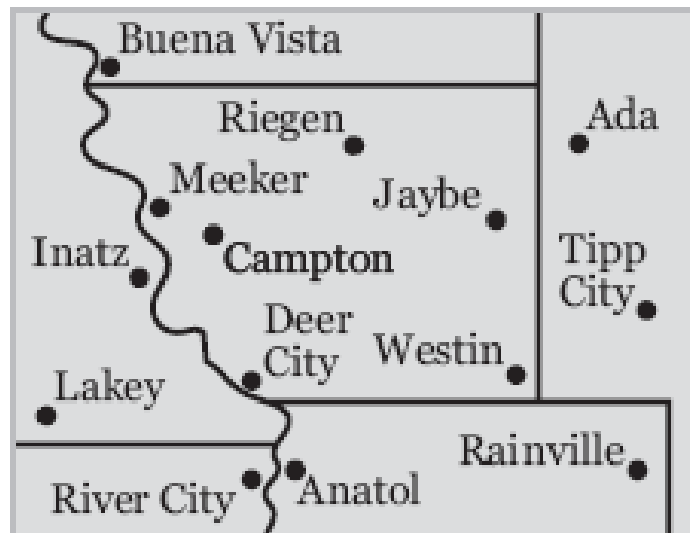


visual difference

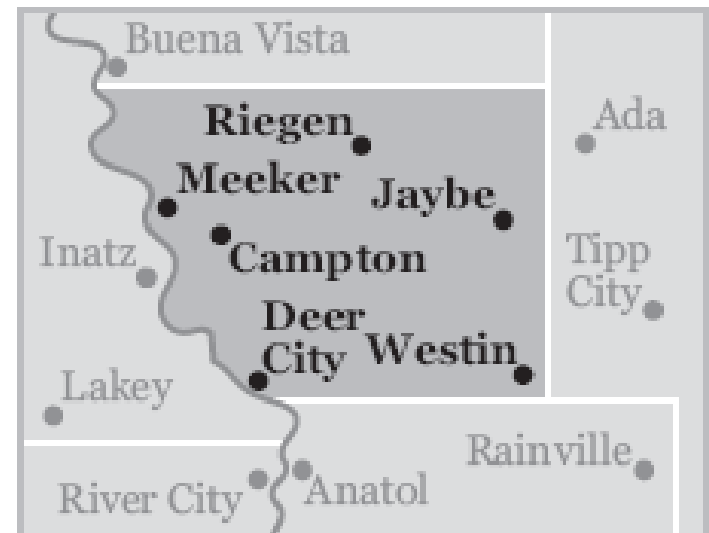
Noticeable visual differences separate figure from ground and enhance visual hierarchy. The examples on the following pages all enhance visual differences to build a visual hierarchy. To focus attention on the most important areas on your map, make it visually different from peripheral areas.



Poor visual difference:

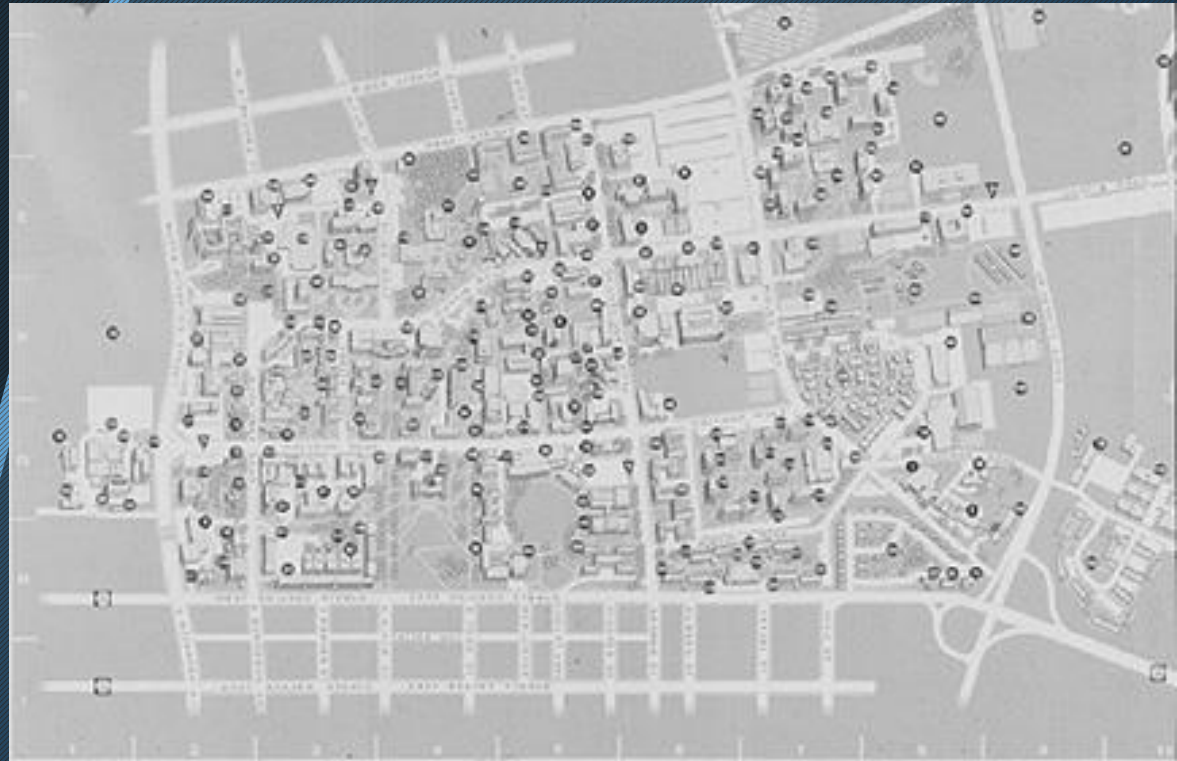


Good visual difference:



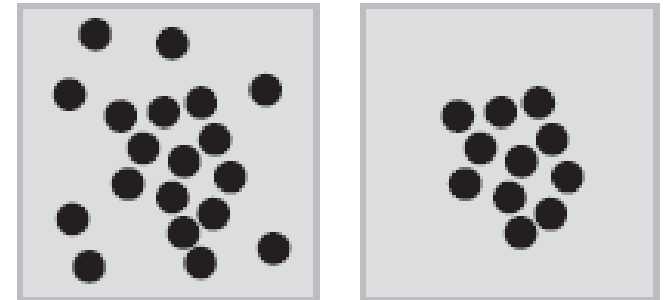
Visual Elements for Figure - Ground

Detail (or Articulation): Figure has more detail than ground

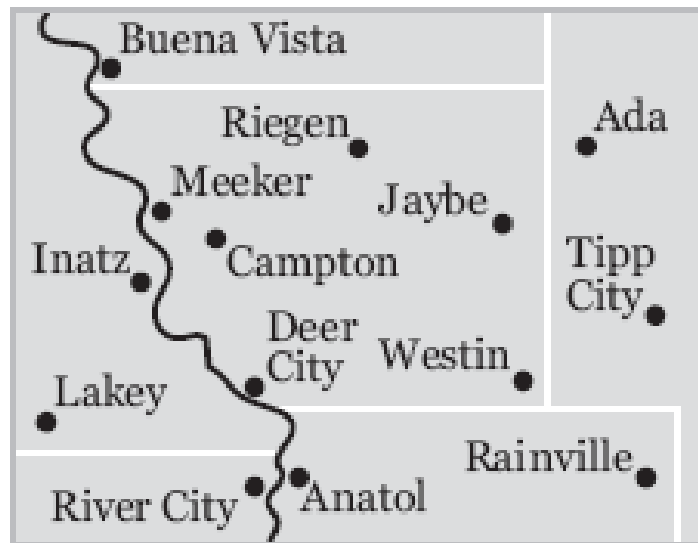


detail

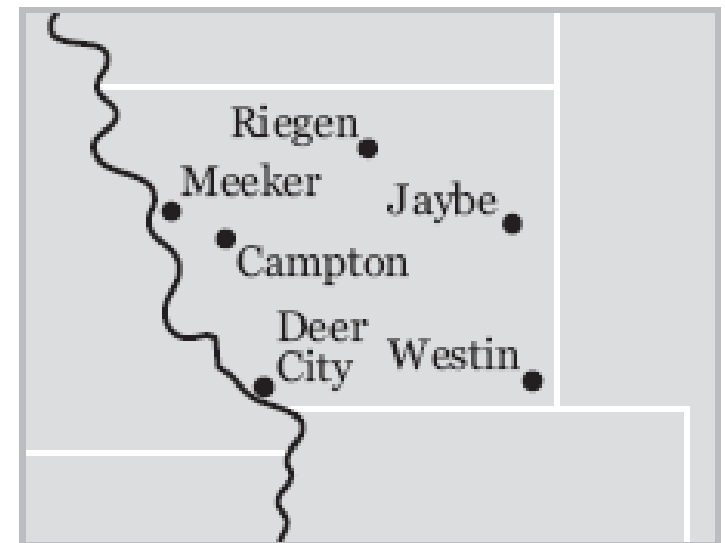
Figure has more detail than ground. To focus attention on the most important area on your map, reduce detail in peripheral areas.



Poor detail:

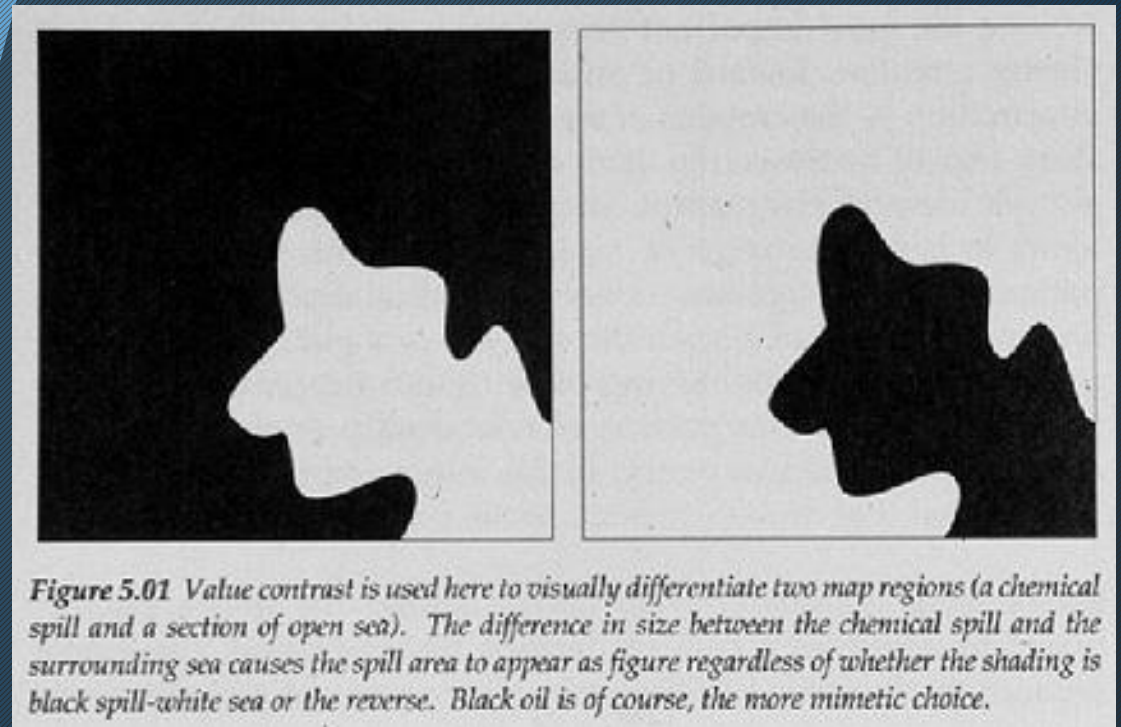
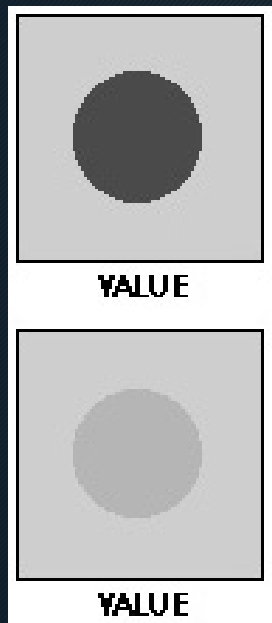


Good detail:



Visual Elements for Figure Ground

Value: Darker areas tend to be figure



Visual Elements for Figure - Ground

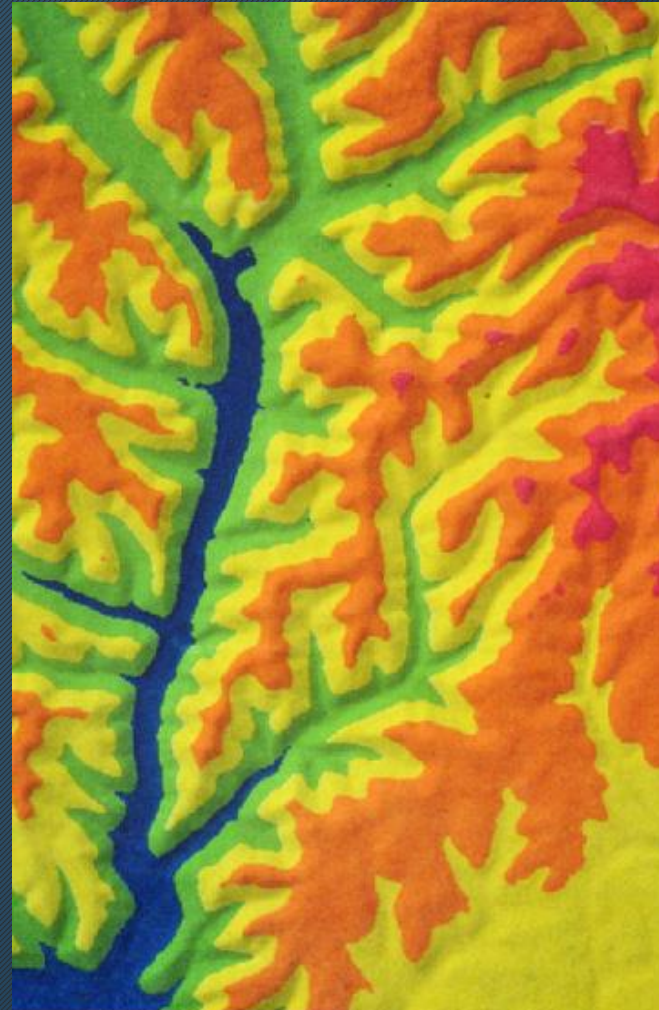
Color: Higher color intensities tend to be figure

Good Figure
Ground

Poor Figure
Ground

Good Figure
Ground

Poor Figure
Ground



Visual Elements for Figure - Ground

Color: Higher color intensities tend to be figure

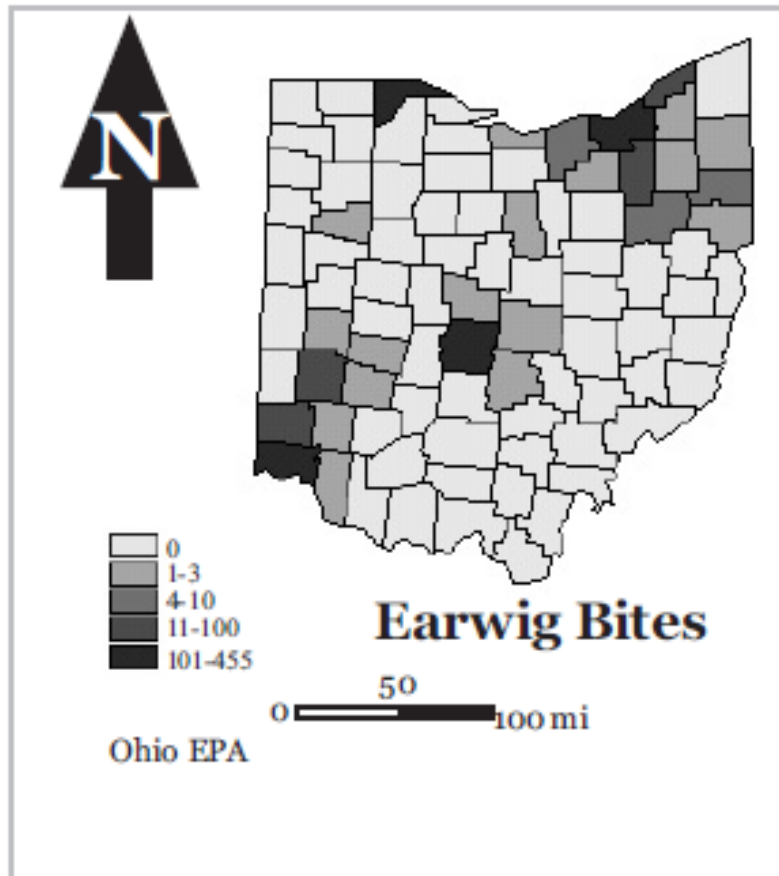


Overall Map Layout

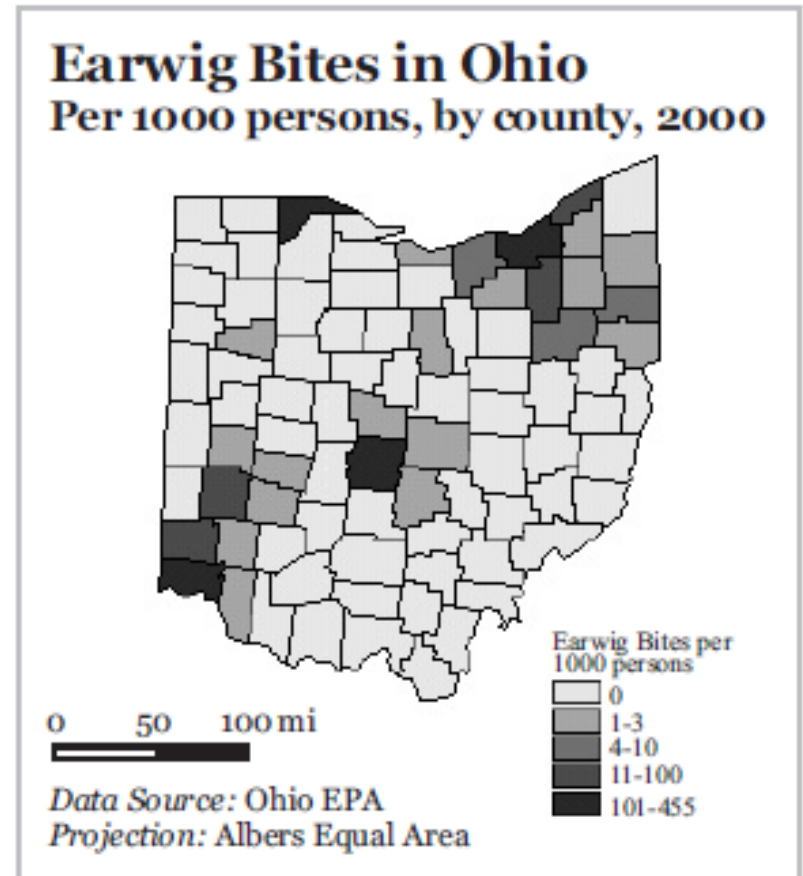
- “ When map layout *succeeds*, map readers *will not notice*: they will focus on the content of the map.
- “ When map layout *fails*, the map reader *will notice*: an awkward layout distracts the map reader from the subject and goals of the map.

Overall Map Layout

Poor layout:



Good layout:

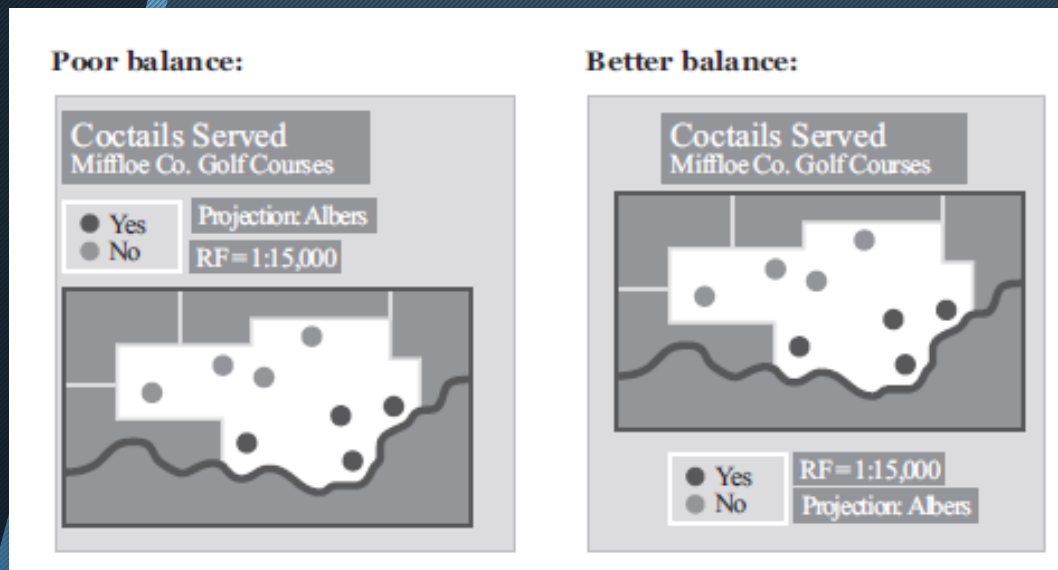


Map Layout

“ Balance: the stability of a map layout
“ Map elements vary in weight



- “ **Heavier** elements include those that are larger, darker, brightly colored, simpler and more compact in shape, and closer to the map edge.
- “ **Lighter** elements include those that are smaller, lighter, dully colored, complex or irregularly shaped, and closer to the map center.



Legibility

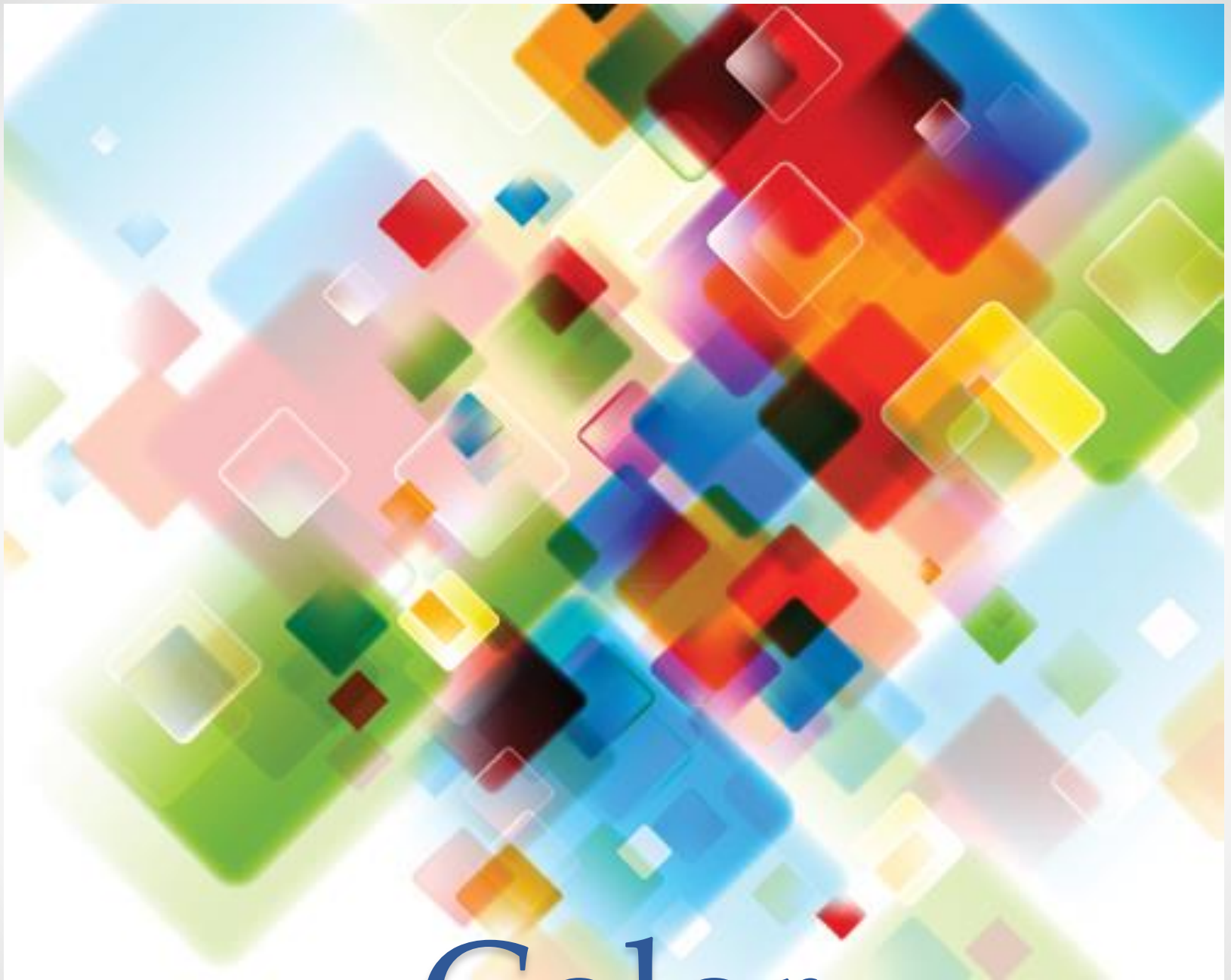
- “ All aspects must be neatly drafted
- “ All symbols should be wisely selected to maximize differences among them and the background they appear on.
- “ Lettering is sufficiently clear and large enough to be viewed
- “ Line work is not so fine as to disappear or be hard to discern

White Space (Empty Space)

“ White Space Conservation

“ All map features should fill the allotted space as nearly as possible.

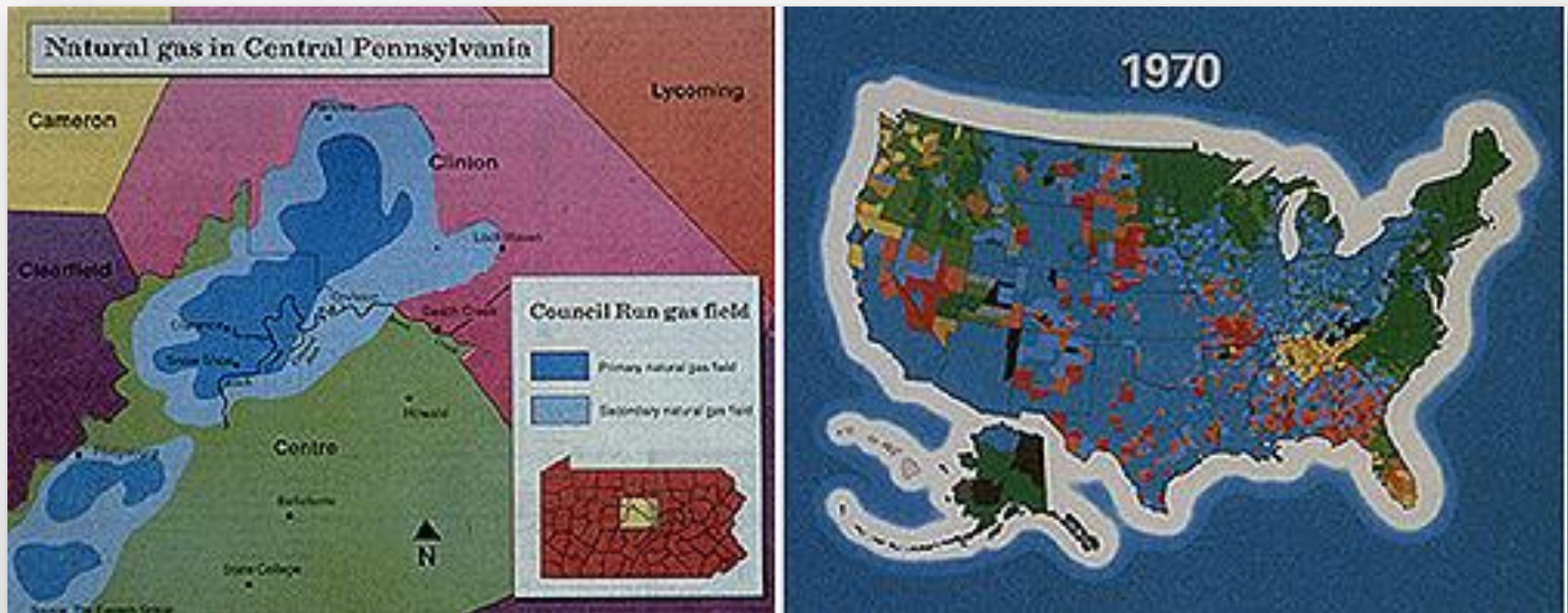
“ Use the space, do not design map elements that waste a lot of space.



Color

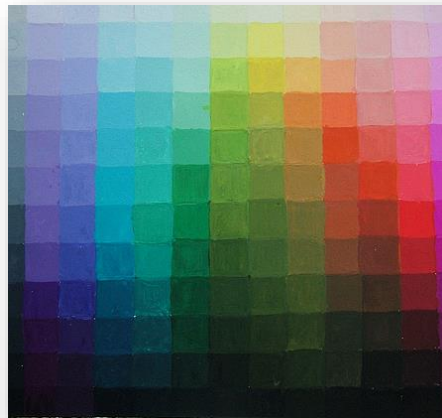
Color in Cartography

- Color is fundamentally important to cartography and fundamentally confusing



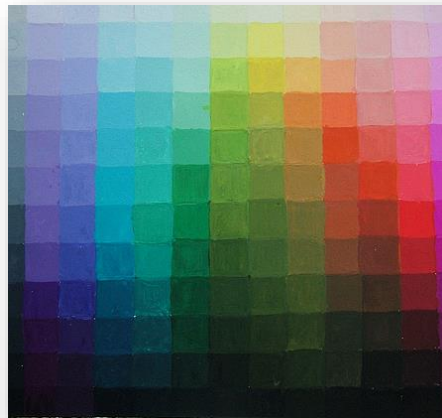
Color in Cartography

- Color is confusing and there are no specific standards
- Many different ways to specify colors
- Color is often misused with new technologies



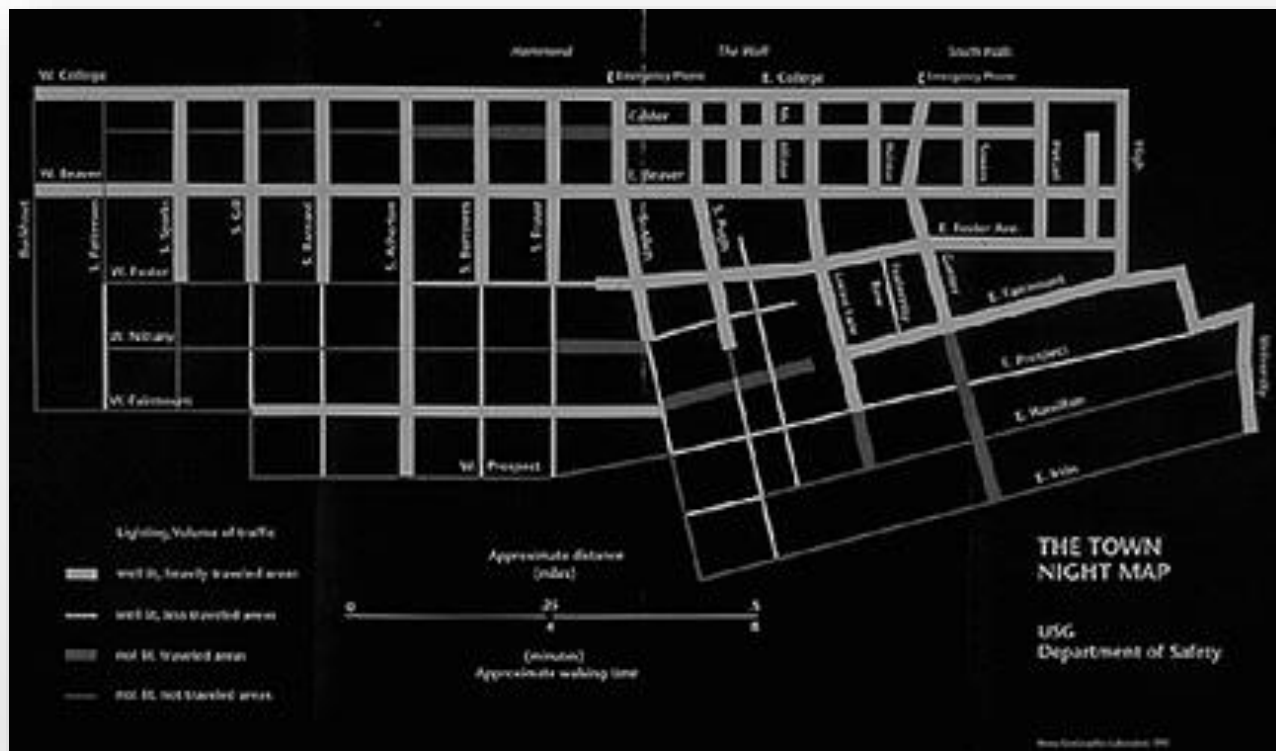
Color in Cartography

- One broad, general rule:
- Use **VALUE** for ranked data (numeric)
- Use **HUE** for nominal data (qualitative)



Color in Cartography

- There is a lot that you can do with black and white.

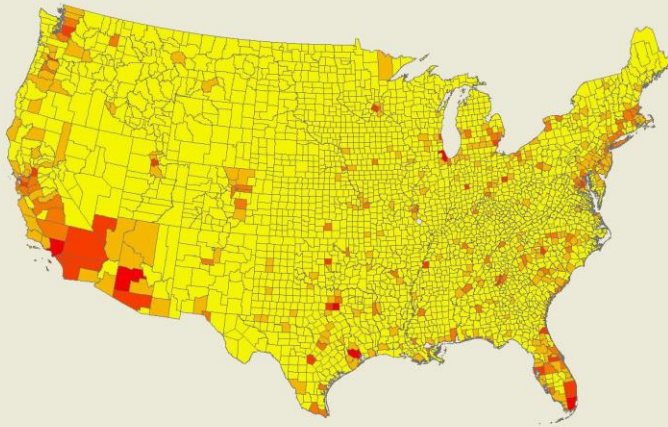


How do we see colors?

- Sensitivity:

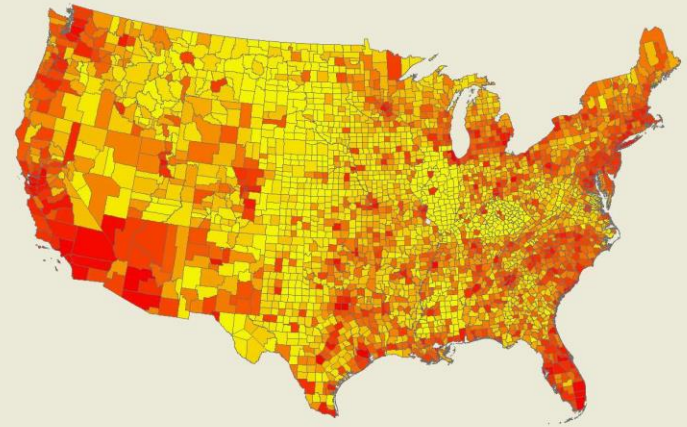
5 classes
CountyNAD83
YR02

0 - 4595
4596 - 17953
17954 - 49847
49848 - 124547
124548 - 394591



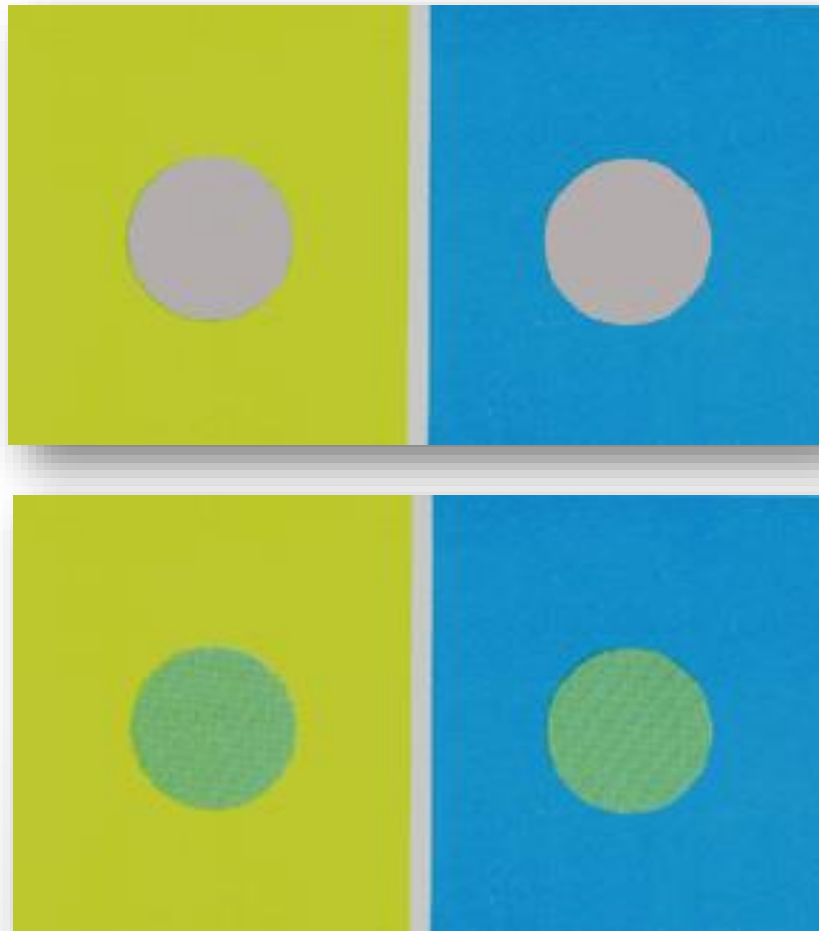
25 classes
CountyNAD83
YR02

0 - 41
42 - 113
114 - 196
197 - 288
289 - 384
385 - 486
487 - 604
605 - 710
711 - 809
810 - 951
952 - 1111
1112 - 1275
1276 - 1479
1480 - 1881
1882 - 2526
2527 - 3381
3382 - 4473
4474 - 5919
5920 - 8996
8997 - 13948
13949 - 20072
20073 - 34075
34076 - 62189
62190 - 124547
124548 - 394591



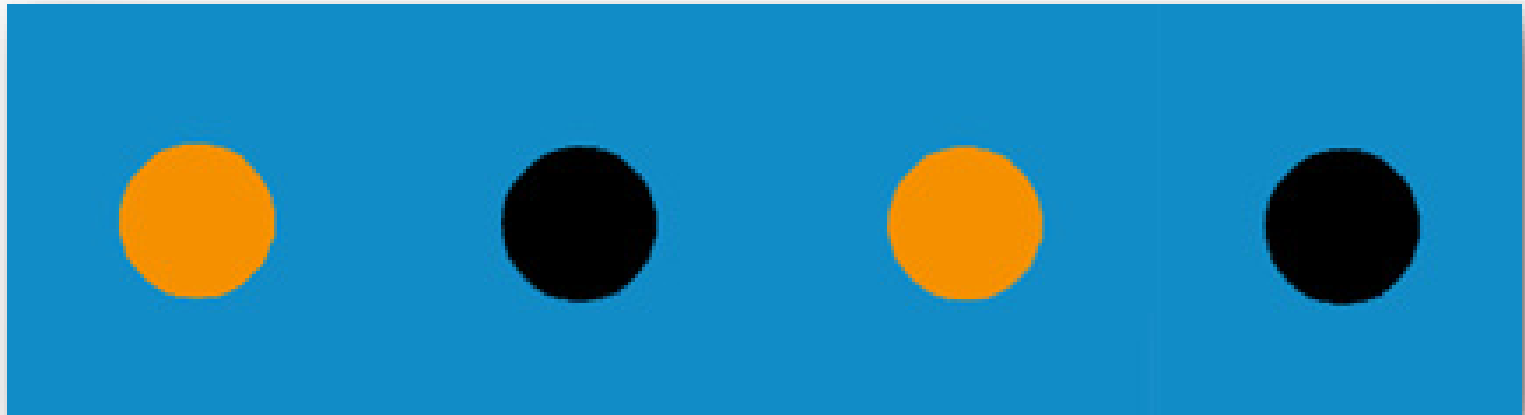
Complexity of Color Use

- Color Interacts with its Environment
- Simultaneous Contrast:



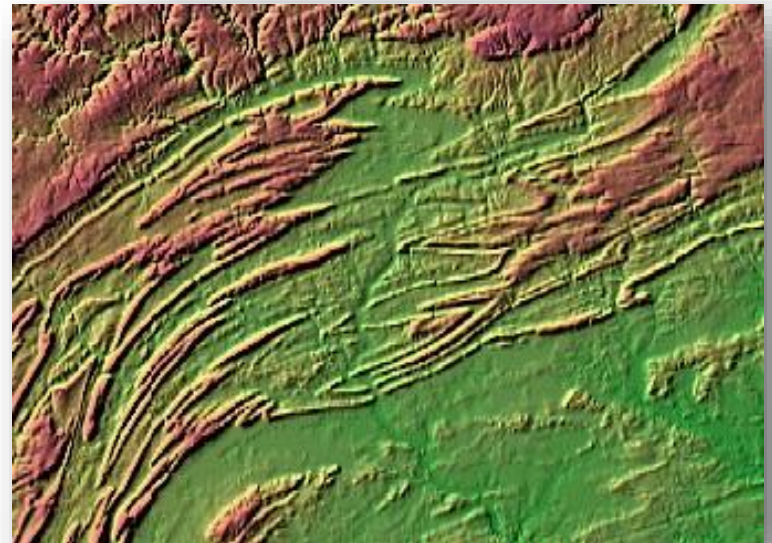
Complexity of Color Use

- Color Interacts with its Environment
- Successive Contrast:



Complexity of Color Use

- Advance and retreat: perceptual phenomena whereby reds seem to advance (stand out more) and greens and blues seem to retreat (fall back more) in the visual plane
- Hypsometric tints

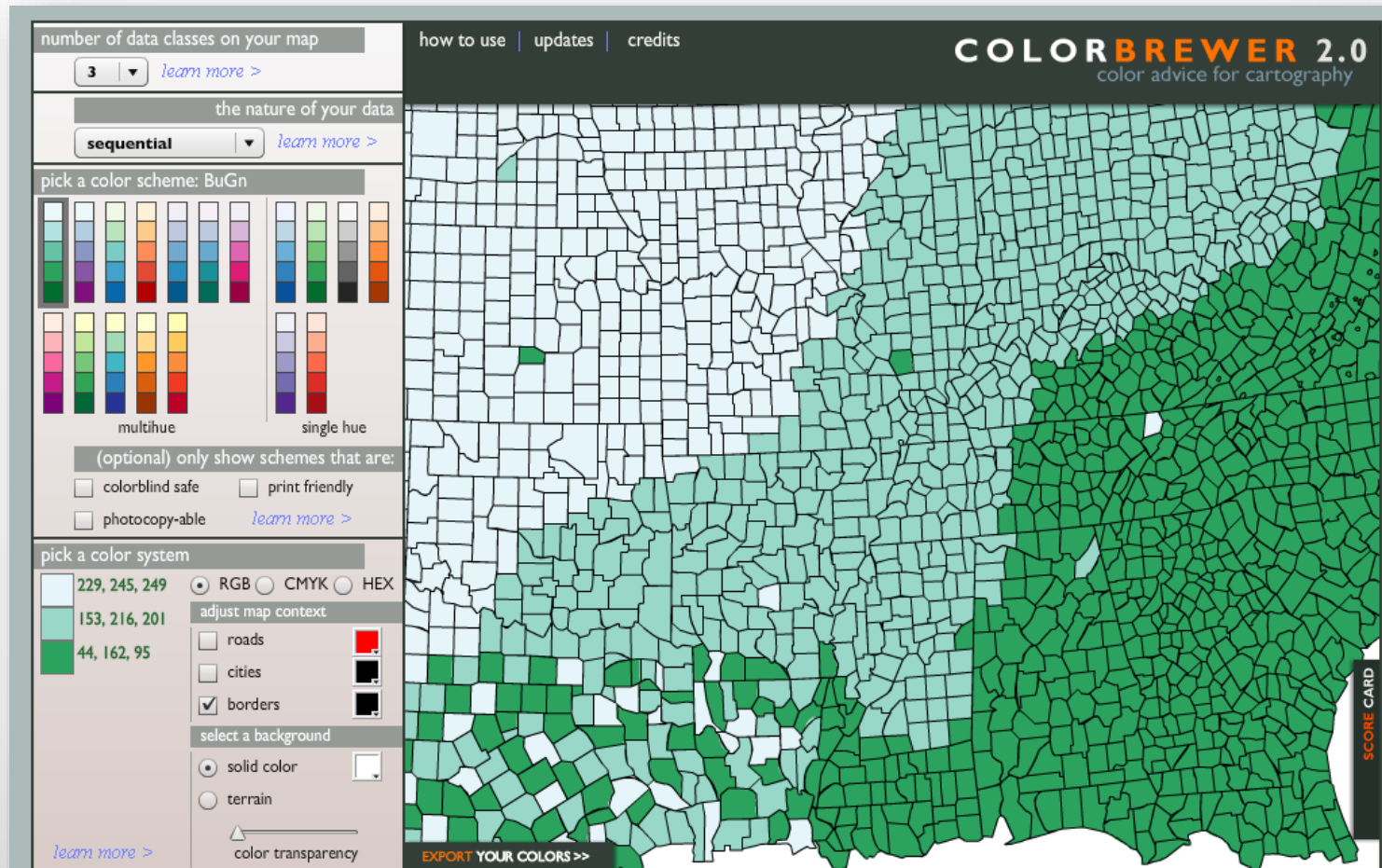


Complexity of Color Use

- Physiological Differences among Individuals
- Young children (< 5 years)
 - Seem to understand only a limited set of hues, and have difficulty arranging different color values in any kind of order
- Older people
 - Less sensitive to color and need brighter (saturated) colors
 - Older people lose the ability to perceive blue
- Color Blindness
 - in 3% of females and 8% of males (red and green look same)
 - Using colors that are colorblind safe

Color Resources

- Color Brewer: web-based tool for choosing appropriate color schemes
- <http://colorbrewer2.org/>

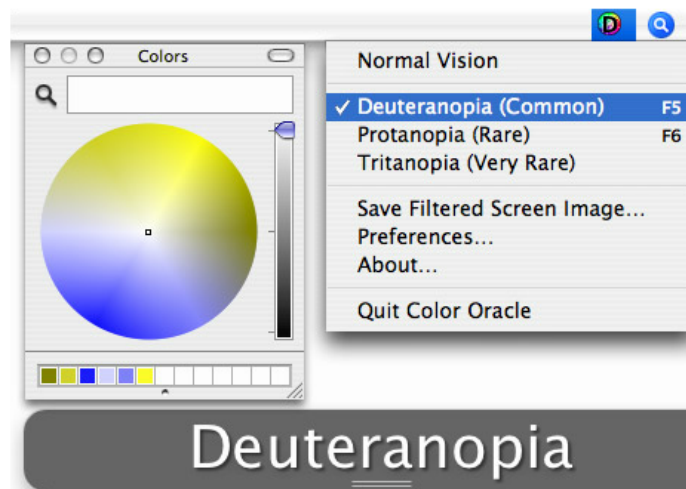


Color Resources

- Designing for Color Blindness
- Color Oracle: Free software that simulates three types of color blindness on your computer screen.
- <http://colororacle.org/index.html>

Color Oracle – Usage

Design for the Color Impaired



Color Oracle in Action


The system-wide menu quickly converts your art into a palette that simulates what colorblind people see. Color Oracle integrates smoothly in your workflow. Select the type of color-blindness in the menu or press one of the keyboard shortcuts while you are working with your preferred graphics software. Color Oracle immediately filters your screen image and hides itself automatically when you press any key or click the mouse button.

Forms of Color Vision Impairment

Color Oracle simulates deuteranopia, protanopia and tritanopia. These are extreme forms of color blindness – most color deficient viewers are seeing more colors. Therefore, if you design your art for people with extreme color blindness, it will also be easily readable by those with minor color blindness and "normal" vision.


Color Resources

- Color Palette Generator
- Submit the URL of an existing image and generate colors that match the image
- <http://www.degraeve.com/color-palette/?src=rss>

 DeGraeve.com

[contact](#) [about](#)

Color Palette Generator



#334433	#225533
#6699aa	#44bbcc
#88aaaa	#88dddd
#aaccff	#bbffff
#447799	#0055bb

dullvibrant


URL of image:

Make color schemes. Enter the URL of an image to get a color palette that matches the image. This is useful for coming up with a website color scheme that matches a stock photo a client wants to work with. If you like this color palette generator, you might like [ColorHunter.com](#)

PPG Auto Color Charts
Order online Quality Acrylic Enamel Basecoat, Urethane, Lacquer Paints
www.AutoColorLibrary.com **AdChoices**

Color Resources

- Color Conversion among different systems
- <http://web.forret.com/tools/color.asp>



Color conversion (RGB / CMYK / HSV / YUV / ...)

[Ads by Google](#) [Pantone CMYK](#) [Pantone Matching](#) [Pantone Swatch](#) [Pantone Color Chart](#)

Overview

This color

#555544 (original) #555544 (websafe) #535353 (greyscale)

CMYK (Cyan Magenta Yellow Key)

0.000 0.000 0.200 0.667

CMYK -> RGB

(values between 0 and 1)

Adjusted CMY:

66.7% 66.7% 73.3%

(values between 0 and 100%)

RGB (Red Green Blue)

85 85 68 RGB -> CM

(values between 0 and 255)

HEX (hexadecimal) notation:

#555544 RGB -> CM

Other color models

Greyscale	83 - 0x53 (67.5 % grey)
HSV	60° 20.0% 33.3%
HSL	60° 6.7% 30.0%
YUV	32.6% -2.9% 0.7%
YIC	32.6% 2.1% -18.7%
Pantone	(no longer available)


Purpose

This is a page that will help you convert colors between RGB, CMYK and HSV color spaces. Some examples:


Sea Green	Royal Blue
Indigo	Sienna
Firebrick	Light coral

To see all RGB colors with an official name, check the [RGB color chart](#)

Host
UNLIMITED
Domains on
1 Account



hostmonster



GET INSPIRED NOW >>

Color Reminders

- Color is misused more than other visual variables.
- Variations and changes in color should mean something. Attempt to correlate variations in the data with logical variations in color.
- Avoid gratuitous use of color. Use color to contribute to understanding, not to add any confusion!